



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

1. Solution by J. W. NICHOLSON, A. M., LL. D., President and Professor of Mathematics, Louisiana State University and Agricultural and Mechanical College, Baton Rouge, Louisiana.

The series is evidently the sum of the following series:

(a)	1	1	1	1	1	1	1	1	1	1	.	.	.	.
(b)			1	2	3	4	5	6	7	8	.	.	.	.
(c)					1	3	6	10	15	21	.	.	.	.
							1	4	10	20	.	.	.	.
									1	5	.	.	.	.
										

The n th term of (a) is 1; the $(n-2)$ th term of (b) is $n-2$; the $(n-4)$ th term of (c) is $\frac{(n-3)(n-4)}{2}$; the $(n-6)$ th term of (d) is $\frac{(n-4)(n-5)(n-6)}{6}$; etc.

Therefore the n th term of the given series is

$$1 + (n-2) + \frac{(n-1)(n-3)}{2} + \frac{(n-6)(n-5)(n-4)}{2.3} + \frac{(n-8)(n-7)(n-6)(n-5)}{2.3.4} + \dots \text{to } 0.$$

Again, the sum of n terms of (a) is n , of $n-2$ terms of (b) is

$\frac{(n-2)(n-1)}{2}$, of $n-4$ terms of (c) is $\frac{(n-4)(n-3)(n-2)}{2 \cdot 3}$, etc.

Therefore, the sum of n terms of the given series is

$$n + \frac{(n-2)(n-1)}{2} + \frac{(n-4)(n-3)(n-2)}{2 \cdot 3} + \frac{(n-6)(n-5)(n-4)(n-3)}{2 \cdot 3 \cdot 4} + \dots \text{to } 0.$$

PROBLEMS.

42. Proposed by ALEXANDER MACFARLANE, A. M., Sc. D., LL. D., Cornell University, Ithaca, New York.

There are p electors and q candidates for r seats. Each elector has r votes, and he may distribute them as he pleases among the candidates. Find in how many different ways the voting may result, that is, the number of possible states of the poll.

43. Proposed by F. M. SHIELDS, Coopwood, Mississippi.

Four men, *A*, *B*, *C*, and *D*, start from the same place, the traveling rates of *A* and *C* are equal, and the traveling rates of *B* and *D* were as 17 to 18, respectively: *B* could travel one mile in 7 minutes and 12 seconds. *A* traveled *due west* a certain distance, *B* traveled *due north* the cube of *A*'s distance *plus* his distance; *C* traveled *due east* a certain distance, and *D* traveled *due south* the cube of *C*'s distance *plus* his distance: They all change directions, and *A* traveled *due north* a certain distance, *B* traveled *due east* the 5th power of *A*'s distance north; *C* traveled *due south* a certain distance, and *D* traveled *due west* the 5th power of *C*'s distance south,—when it was found that the sum of the north and south distances traveled by *B* and *D* was 351090 feet, and the sum of the distances *B* and *D* traveled east and west was 5929200000 feet, and that the product of the distances that *A* and *C* traveled east and west *plus* the square of the difference of these distances, *plus one* was 3901; and

that the product of the distances that *A* and *C* traveled north and south *plus* the square of the difference *squared*, plus the product multiplied by the square of the difference, was 49410000 [equal to the following new formulas:

$(nn+d^2+1)=3901$, and $\{(nn+d^2)^2+(nn \times d^2)\}=49410000$]. How far on a line is each party from the starting place, and how long did it require for *B* and *D* each to make the entire trip from starting place to the end?

[The Proposer says: "A city lot at St. Andrews, Florida, will be given to the party sending the EDITOR the first correct answer to the above problem-No. 43].

GEOMETRY.

Conducted by B. F. FINKEL, Kidder, Mo. All contributions to this department should be sent to him.

SOLUTIONS TO PROBLEMS.

25. Proposed by L. B. FRAKER, Weston, Ohio.

The sides of a quadrilateral board are $AB=7$ inches, $BC=15$ inches, $CD=21$ inches, and $DA=13$ inches; radius of inscribed circle is 6 inches. (1) What are dimensions of the largest rectangular board that can be cut out of the given board, (2) largest square, (3) largest equilateral triangle? (Please solve without use of the calculus.)

II. Solution by Professor G. B. M. ZERR, A. M., Principal of High School, Staunton, Virginia.

From the solution of this problem on page 354, No. 10, Vol., I., we find for another set of values for the angles, $A=112^\circ 37' 11''$, $B=126^\circ 52' 12''$, $C=53^\circ 7' 38''$, $D=67^\circ 22' 49''$. This demonstrates that AB and CD are parallel. Since CD is the longest side and also parallel to AB , one side of the rectangle and square will coincide with DC . Let KI and HI be the sides of the rectangle.

Then $\frac{1}{2}(AB+DC) \times EF = KI \times HI + \frac{1}{2}(AB+KI)(EF-HI) + \frac{1}{2}HI(DK+IC)$.

$$\therefore \frac{1}{2}(7+21) \times 12 = KI \times HI + \frac{1}{2}(7+KI)(12-HI) + \frac{1}{2}(HI)(21-KI).$$

$$\therefore 126 = 6KI + 7HI. \text{ For a maximum } 6KI = 7HI.$$

$$\therefore HI = 9 \text{ inches, } KI = 10\frac{1}{2} \text{ inches.}$$

$\therefore GHIK$ is the rectangle.

For the square $KI = HI$.

$$\therefore 126 = 13KI, \therefore KI = 9.692 + \text{inches.}$$

$\therefore LMNP$ is the square.

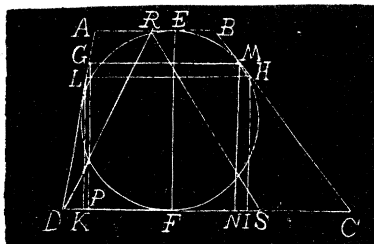
For the triangle, draw DR making the angle $RDC = 60^\circ$.

$$\text{Then } DR^2 = EF^2 + \frac{1}{4}DR^2.$$

$$\therefore \frac{3}{4}DR^2 = 144, DR^2 = 192,$$

$$DR = 13.856 \text{ inches.}$$

$\therefore DRS$ is the triangle.



The above solution is the result of suggestions from the Proposer.